

Seznam limit

Posloupnosti

Škála

$$1. \lim_{n \rightarrow +\infty} \frac{n!}{n^n} = 0$$

$$3. \beta > 0, a > 1: \lim_{n \rightarrow +\infty} \frac{n^\beta}{a^n} = 0.$$

$$2. a > 1: \lim_{n \rightarrow +\infty} \frac{a^n}{n!} = 0.$$

$$4. \alpha > 0, \beta > 0: \lim_{n \rightarrow +\infty} \frac{\log^\alpha n}{n^\beta} = 0.$$

$$\log^\alpha n \ll n^\beta \ll a^n \ll n! \ll n^n$$

n -tá odmocnina

Nechť $\alpha > 0$, pak:

$$1. \lim_{n \rightarrow +\infty} \sqrt[n]{\alpha} = 1 \quad 2. \lim_{n \rightarrow +\infty} \sqrt[n]{n} = 1 \quad 3. \lim_{n \rightarrow +\infty} \sqrt[n]{n^\alpha} = 1 \quad 4. \lim_{n \rightarrow +\infty} \sqrt[n]{n!} = +\infty$$

Exponenciála

$$\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = e$$

Funkce

Goniometrické funkce

$$\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{\tan x}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{\arcsin x}{x} = 1$$

$$\lim_{x \rightarrow \infty} x \operatorname{arccot} x = 1$$

$$\lim_{x \rightarrow 0} \frac{1 - \cos x}{x^2} = \frac{1}{2}$$

$$\lim_{x \rightarrow 0} \frac{\arctan x}{x} = 1$$

$$\lim_{x \rightarrow 1^-} \frac{\arccos x}{\sqrt{1-x}} = \sqrt{2}$$

Logaritmus, exponenciální funkce

$\alpha > 0, \beta > 0, c > 1$:

$$\lim_{x \rightarrow 0} \frac{e^x - 1}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{\log(1+x)}{x} = 1.$$

$$\lim_{x \rightarrow 1} \frac{\log(x)}{x-1} = 1.$$

$$\lim_{x \rightarrow +\infty} \frac{\log^\alpha x}{x^\beta} = 0$$

$$\lim_{x \rightarrow +\infty} \frac{x^\beta}{c^x} = 0.$$

Hyperbolické funkce

$$\begin{aligned} \sinh x &= \frac{e^x - e^{-x}}{2} & \tanh x &= \frac{\sinh x}{\cosh x} = \frac{e^x - e^{-x}}{e^x + e^{-x}} \\ \cosh x &= \frac{e^x + e^{-x}}{2} & \coth x &= \frac{\cosh x}{\sinh x} = \frac{e^x + e^{-x}}{e^x - e^{-x}} \end{aligned}$$

$$\lim_{x \rightarrow 0} \frac{\sinh x}{x} = 1$$

$$\lim_{x \rightarrow 0} \frac{\cosh x - 1}{x^2} = \frac{1}{2}$$